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# UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No. 9324-018 Total Pages 24

First Named Inventor or Application Identifier

Wai-Wah Yiu

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PTO  
09/26/00

## APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO: Assistant Commissioner for Patents  
Box Patent Application  
Washington, DC 20231

1. ☒ Fee Transmittal Form  
Submit an original, and a duplicate for fee processing)
2. ☒ Specification [Total Pages 14]  
(preferred arrangement set forth below)  
-Descriptive title of the invention  
-Cross Reference to Related Applications  
-Statement Regarding Fed sponsored R&D  
-Reference to Microfiche Appendix  
-Background of the invention  
-Brief Summary of the invention  
-Brief Description of the Drawings (if filed)  
-Detailed Description of the invention (including drawings, if filed)  
-Claim(s)  
-Abstract of the Disclosure
3. ☒ Drawing(s) (35 USC 113) [Total Sheets 5]
4. ☒ Oath or Declaration (unexecuted) [Total Sheets 2]  
a. ☐ Newly executed (original or copy)  
b. ☐ Copy from a prior application (37 CFR 1.63(d))  
(for continuation/divisional with Box 17 completed)  
[Note Box 5 below]  
i. ☐ DELETION OF INVENTOR(S)  
Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33 (b).
5. ☐ Incorporation By Reference (useable if Box 4b is checked)  
The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.
6. ☐ Microfiche Computer Program (Appendix)
7. ☐ Nucleotide and/or Amino Acid Sequence Submission (if applicable, all necessary)  
a. ☐ Computer Readable Copy  
b. ☐ Paper Copy (identical to computer copy)  
c. ☐ Statement verifying identity of above copies

## ACCOMPANYING APPLICATION PARTS

8. ☐ Assignment Papers (cover sheet & document(s))
9. ☐ 37 CFR 3.73(b) Statement ☐ Power of Attorney (when there is an assignee)
10. ☐ English Translation Document (if applicable)
11. ☐ Information Disclosure ☐ Copies of IDS Statement (IDS)/PTO-1449 Citations
12. ☐ Preliminary Amendment
13. ☒ Return Receipt Postcard (MPEP 503) (Should be specifically itemized)
14. ☐ Small Entity ☒ Statement filed in prior application, Statement(s) Status still proper and desired
15. ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed)
16. ☐ Other:

## 17. If a CONTINUING APPLICATION, check appropriate box and supply the requisite information:

- ☐ Continuation ☐ Divisional ☒ Continuation-in-part (CIP) of prior application No: 09/246,454 filed February 9, 1999.

## 18. CORRESPONDENCE ADDRESS

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ATTORNEY DOCKET NO. 9324-018Date: September 26, 2000

Assistant Commissioner for Patents  
 Box PATENT APPLICATION  
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Sir:

The following utility patent application is enclosed for filing:

Applicant(s): Wai -Wah YiuExecuted on: Not ExecutedTitle of Invention: HAIR REMOVAL DEVICE WITH DISC AND VIBRATION ASSEMBLIES**PATENT APPLICATION FEE VALUE**

TYPE	NO. FILED	LESS	EXTRA	EXTRA RATE	FEE
Total Claims	30	-20	10	\$18.00 each	\$ 180.00
Independent	3	-3	0	\$78.00 each	\$ 0.00
Minimum Fee					\$ 690.00
Multiple Dependency Fee If Applicable (\$260.00)					\$ 0.00
<b>Total</b>					\$ 870.00
50% Reduction for Independent Inventor, Nonprofit Organization or Small Business Concern (a verified statement as to the applicant's status is attached)					- \$ 435.00
<b>Total Filing Fee</b>					\$ 435.00

- ☐ Priority of application no. filed on in is claimed under 35 U.S.C. § 119.  
☐ The certified copy of the priority application has been filed in application no. filed  
☐ Amend the specification by inserting before the first line the following sentence:

Please charge the required fee to Pennie & Edmonds LLP Deposit Account No. 16-1150. A copy of this sheet is enclosed.

Respectfully submitted,

*Barry D. Rein*  
 Barry D. Rein  
 PENNIE & EDMONDS LLP

35,177 for

22,411

(Reg. No.)

Enclosure

This form is not for use with continuation, divisional, re-issue, design or plant patent applications.

## HAIR REMOVAL DEVICE WITH DISC AND VIBRATION ASSEMBLIES

This is a continuation-in-part of application serial no. 09/246,454, filed February 9, 1999 and will issue on September 26, 2000 as U.S. Patent No. 6,123,713, which is itself a continuation-in-part of application serial no. 09/112,971, filed July 9, 1998 and issued November 2, 1999 as U.S. Patent No. 5,976,157. We incorporate both patents by reference in their entirety.

### FIELD OF THE INVENTION

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The present invention relates generally to a depilatory device for removal of unwanted hair, and more specifically, to a device for removing unwanted hair by trapping and uprooting the hair while at the same time massaging the hair-removal area to reduce discomfort associated with hair removal.

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### BACKGROUND OF THE INVENTION

There exists a need for removal of unwanted hair in order to maintain a desirable physical appearance. There are many devices known in the art that are useful for removing unwanted hair such as razors, tweezers and other depilatory devices. Although razors provide quick and easy hair removal, hair remains visible at the surface of the skin and quickly regrows. Therefore one must shave frequently in order to maintain smooth skin and a desired appearance.

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On the other hand, tweezers provide longer-lasting hair removal than razors since, instead of merely cutting hair, tweezers remove the hair at its root. However, removing hair with tweezers is a tedious process since traditional tweezers can only remove one hair at a time and precise handling of the tweezers is required in order to position and grasp the hair between the two, usually small, opposing surfaces. Furthermore, care must be taken so that the hair is not inadvertently broken above the root leaving stubbles.

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Other depilatory devices are known in the art such as one described in U.S. Patent No. 5,281,233 to Dolev ("Dolev patent"). The Dolev hair removal device generally comprises a housing and a hair-plucking assembly rotatably mounted to the housing. The hair plucking assembly includes at least one disc assembly comprising (i) a pair of complementary discs, each of the discs having at least three radially extending arms

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terminating in flattened peripheral portions, which, when pressed against corresponding flattened peripheral portion of the arms of the other disc, form a trap for the hair; and (ii) a hub for accommodating and rotating the pair of discs so that the flattened peripheral portions of the discs are alternately brought together to form a trap to grasp the hair to be removed, and forced apart to eject the removed hair. The Dolev hair device, however, merely includes one row of disc assemblies, which limits the number of hair it can remove at one time. Moreover, it lacks any mechanism for making the hair-removal process more comfortable for the user.

There is a need, therefore, for a depilatory device that is as easy and inexpensive to assemble and maintain as prior art devices but, at the same time, can easily uproot a greater number of hairs over a larger hair-removal area than is currently possible. In addition, there is also an ongoing need for depilatory devices to reduce discomfort associated with hair removal.

## SUMMARY OF THE INVENTION

According to the present invention, the foregoing and other objects and advantages are attained by a hair removal device comprising a housing and a hair-plucking assembly. In preferred embodiments, the hair-removal assembly includes at least two groups of disc assemblies mounted within the housing. The disc assemblies may be arranged in at least two rows, which may be adjacent and/or parallel to one another. Disc assemblies arranged in a row may be rotationally fixed with respect to one another and may rotate together at a constant speed.

The disc assemblies may also be identical to one another. Each disc assembly may include an internal disc assembly and a pair of outer discs. Each internal disc may, in turn, comprise an insert disc having at least one arm and may be mounted on a disc carrier. Each outer disc may also have at least one arm and may be mounted on the internal disc assembly. The arm(s) of each outer disc may be pressed against the arm(s) of the internal disc to form traps for hair.

The disc carrier may further comprise at least one U-shaped member for engaging at least one arm of each of the pair of outer discs so as to impart rotational motion to the pair of outer discs upon rotation of the internal structure about an axis of the internal structure. The disc carrier may further comprise at least a pair of pinchers that extends

axially from the U-shaped member(s) beyond the plane of the arm of each of the pair of outer discs for imparting a clamping force on at least one adjacent disc carrier. The disc carrier may further comprise engagement means for engaging at least one adjacent disc carrier so that rotational movement of one disc carrier imparts rotational motion to at least one adjacent disc carrier. The engagement means may comprise engagement protrusions and engagement recessions for engaging corresponding protrusions and recessions of at least one adjacent disc carrier. Finally, disc assemblies may be rotatably mounted on two shafts. The shafts may further be curved so that the disc assemblies are mounted in an inclined angle.

In accordance with another preferred embodiment of the invention, the hair removal device may comprise a housing, a hair-plucking assembly, and a vibration assembly mounted within the housing. The vibration assembly may comprise a vibration element to massage the hair removal area. This vibration element may be rotatably mounted on eccentric cylinders and may vibrate at a constant speed.

The housing may comprise brackets for mounting the hair-plucking assembly and vibration assembly to the housing. The vibration element may be located adjacent to the hair-plucking assembly and may act to move towards and away from the hair-plucking assembly. The vibration element may span at least the width of the hair-plucking assembly.

As discussed above, the hair-plucking assembly may comprise disc assemblies which are arranged in two rows, wherein the vibration element may be located between the rows of disc assemblies. The hair-plucking assembly and the vibration assembly may be powered by a driving assembly.

## **BRIEF DESCRIPTION OF THE DRAWINGS**

For a more complete understanding of the present invention, reference is made to the following Detailed Description taken in conjunction with the accompanying drawings in which:

FIG. 1 is a front elevational view of a hair remover according to the invention;

FIG. 2 is a top plan view of the hair remover of Fig. 1;

FIG. 3 is a side elevational view of the hair remover of Fig. 1;

FIG. 4 is a front partial section view of the hair remover taken along line A-A of FIG. 3, featuring a number of disc assemblies;

FIG. 5 is a side partial section view taken along line 2-2 of the hair remover of Fig. 4;

FIG. 6 is a front partial section view of the hair remover taken along line B-B of FIG. 5,

5 featuring a number of disc assemblies;

FIG. 7 is an exploded view of the outer discs and the internal disc assembly of the invention;

FIG. 8 is a plan view of the disc assembly of FIG. 6, such as might be used in the device of FIG. 1;

10 FIG. 9 is a perspective view of the disc assembly of FIG. 7;

FIG. 10 is a perspective view of a vibration system in the hair remover of FIG. 1;

FIG. 11 is a side cross-sectional view taken along line 1-1 of FIG. 4 illustrating the vibration assembly with vibration element in a low position; and

FIG. 12 is a side cross-sectional view similar to Fig. 10 of the vibration assembly with the vibration element in a high position.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

**FIGs. 1-12** illustrate a preferred embodiment of the hair removal device **10** according to the present invention. As shown in **FIGs. 1-12**, hair removal device **10** preferably includes a hair-plucking assembly **14** (**FIG. 1, 2**), a vibration assembly **603** (**FIG. 9**), a driving assembly **216, 202-207** (**FIG. 4, 6**), and a housing **17** (**FIG. 3**).

As shown in **FIGs. 1-2**, hair-plucking assembly **14** preferably includes, among other components described further below, a plurality of disc assemblies **500**. A preferred embodiment of disc assembly **500** is illustrated in further detail in **FIGs. 7-9**. As shown in **Fig. 7**, each disc assembly **500** preferably includes three main elements: an internal disc assembly **301** and two outer discs **212**. Each internal disc assembly **301** includes a disc carrier **302** and an insert disc **501**. Each disc carrier **302**, in turn, includes U-shaped members **305**, opposing pinchers **306**, engagement protrusions **303**, and engagement recessions **304**. Each insert disc **501** and outer disc **212** includes three radially extending arms oriented approximately 120° apart with each arm terminating in flattened peripheral portions **502** and **402** respectively.

U-shaped members **305** of disc carrier **302** imparts rotational motion to outer discs **212**. In addition, U-shaped members **305** serve as platforms for opposing pinchers

306, elevating opposing pinchers 306 out of the plane of radially extending arms 401 of outer disc 212 when outer disc 212 is mounted on internal disc assembly 301, as may be appreciated in FIG. 9. Opposing pinchers 306 exert pressure on flattened peripheral portions 402 of adjacent disc assemblies 500 in order to form traps for hair, as described in  
5 further detail below. Engagement protrusions 303 and engagement recessions 304 connect adjacent disc assemblies 500 together, as described in further detail below.

As illustrated in FIG. 7, the central portion of each outer disc 212 preferably includes a generally circular opening, which is sized and shaped so that each outer disc 212  
10 may be mounted on internal disc assembly 301, as illustrated in FIG. 9. The configuration, *i.e.*, dimensions and tolerances, of components 212, 303 of each disc assembly 500 is designed such that these components fit snugly together and remain engaged during operation of the device 10 (FIG. 1).

15 When outer discs 212 are mounted on internal disc assembly 301, flattened peripheral portions 402 of outer discs 212 are aligned with flattened peripheral portion 502 of internal disc assembly 301, so that when flattened peripheral portions 402 are pressed against the corresponding flattened peripheral portion 502, as illustrated in FIG. 9, traps that can grasp and hold hair are formed between flattened peripheral portion 502 and  
20 adjacent flattened peripheral portions 402.

It should be noted that, in alternative embodiments, disc assembly 500 may include one or two integral pieces having between them all the elements of the three components 212, 301, 212 discussed above. In addition, it should be noted that any hair-  
25 plucking disc assembly may be used, including the disc assembly described in Dolev's patent 5,281,233. We, therefore, incorporate by reference the disc assembly described in Dolev.

As shown in FIGs. 4-6, in addition to a plurality of disc assemblies 500,  
30 hair-plucking assembly 14 also preferably includes shafts 219, bearings 210, bearing supports 209, and disc drive gears 220.

Shafts 219 are preferably curved for mounting disc assemblies 500 (FIG. 6). Mounting disc assemblies 500 on curved shafts 219 allows disc assemblies 500 to form  
35 traps for hair, as described in further detail below. Shafts 219 may be made of any appropriate material, including various rigid or flexible materials; however, appropriate

support must be provided for curved shafts made of flexible material. Bearings **210** and bearing supports **209** transfer rotational force from disc drive gears **220** to disc assemblies **500** as well as ensure smooth rotation of disc assemblies **500**. Disc drive gears **220** impart rotational motion to disc assemblies **500** through bearings **210** and bearing supports **209**.

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In the preferred embodiment illustrated in **FIGs. 4-6**, each disc assembly **500** is rotatably mounted on shafts **219**, wherein each disc assembly **500** is engaged to adjacent disc assembly or assemblies **500** via engagement protrusions **303** and recessions **304**. Specifically, each engagement protrusion **303** of one disc assembly **500** is inserted into an engagement recession **304** of an adjacent disc assembly **500** in a gear-like fashion. As a consequence of engaging disc assemblies **500**, each disc assemblies **500** is angularly offset from adjacent disc assemblies **500** by  $60^{\circ}$  so that flattened peripheral portions **402** of a disc assembly **500** are aligned with opposing pinchers **306** of adjacent disc assemblies **500**. Moreover, disc assemblies **500** engaged to one another are rotationally fixed with respect to one another so that they rotate in sync.

Bearings **210** and bearing supports **209** are placed between each end of each row of disc assemblies **500** and disc driving gears **220**, respectively, to transfer rotation speed from disc driving gears **220** to hair-plucking assembly **14** as well as to facilitate smooth and steady rotation of disc assemblies **500**. Disc driving gears **220** provide rotational motion to hair-plucking assembly **14**.

Preferably, the portions of disc assembly **500** intended for contact with the hair are made of a metal material such as stainless steel, which is particularly effective for plucking hair, and the portions of disc assembly **500** which contact curved shafts **219** are made of plastic such as Acetal plastic to facilitate smooth rotation of the disc assembly **500**. Alternatively, these components may be made up of other appropriate materials known in the art.

It should be noted that, although **FIGs. 2, 4, and 6** show that the preferred embodiment includes six disc assemblies **500** in each row of disc assemblies, in alternative embodiments, any number of disc assemblies **500** may be included in each row. In addition, it should be noted that shafts **219** need not be curved if the particular disc assemblies used do not require mounting in an inclined angle to best trap hair.

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Turning now to a preferred embodiment of vibration assembly 603 depicted in FIGs. 10-12, vibration assembly 603 includes a vibration element 217, vibration assembly gear 208, and eccentric cylinder 601. Vibration element 217 is rotatably mounted on eccentric cylinder 601, which are, in turn, fixed to vibration assembly gear 208.

- 5 Vibration element 217 may be made of any hard and rigid material capable of withstanding all kinds of forces and scratches by vibration gear 208. Moreover, the surface of vibration element 217, which makes contact with the skin of the user, may be smooth or textured to provide various desired massage sensations. Mounting vibration element 217 on eccentric cylinder 601 allows vibration assembly gear 208 to impart motion to vibration element 217  
10 as vibration assembly gears 208 rotate. This creates vibrations resulting in the massaging function of the present invention, as described in further detail below.

- Turning now to a preferred embodiment of a driving assembly depicted in FIGs. 4 and 6, the driving assembly includes a motor 216, a motor shaft 202, a motor shaft  
15 gear 203, a reduction gear 204, a reduction gear shaft 205, a transmission gear 206, and a transmission gear shaft 207. Motor 216 drives both hair-plucking assembly 14 (FIG. 1) as well as vibration assembly 603 (FIG. 9) via reduction gear system 202-207, and can be any type of motor capable of imparting rotational motion to the reduction gear system 202-207. Motor 216 may be operated by any convenient and available power source such as a battery  
20 or house current via a DC adaptor. Motor shaft gear 203, reduction gear 204, and transmission gear 206 are mounted on motor shaft 202, reduction gear shaft 205, and transmission gear shaft 207 respectively. Motor shaft gear 203 is engaged with reduction gear 204, which is, in turn, engaged with transmission gear 206 to form a reduction gear system that converts the rotational speed imparted by motor 216 to a proper rotational speed  
25 to drive hair-plucking assembly 14 and vibration assembly 603.

- Turning now to a preferred embodiment of housing 17 depicted in FIGs. 1-6, housing 17 preferably includes two cooperating housing halves 11, 13 (FIG. 3), brackets 201, 213 (FIGs. 2, 4, 6), motor housing 218 (FIG. 4, 6), and power switch 15 (FIGs. 1, 3).  
30 Housing halves 11, 13 are ergonomically shaped to facilitate easy and comfortable gripping by one hand and is preferably constructed of plastic, although alternative materials may also be used. Brackets 201, 213 hold hair-plucking assembly 14 (FIG. 1) and vibration assembly 603 (FIG. 10) in place within housing 17. Similarly, motor housing 218 holds motor 216 and reduction gear system 202-207 in place within housing 17 for proper  
35 operation.

In operation, when a preferred embodiment of hair-removal device **10** as illustrated in **FIG. 4** and **6** is turned on via on/off switch **15** (**FIGs. 1, 3**), motor **216** is activated and imparts rotational force to motor shaft **202**, which, in turn, imparts rotational force to motor shaft gear **203**. Motor shaft gear **203**, in turn, drives reduction gear **204** which drives transmission gear **206**. Transmission gear **206** then imparts rotational force to vibration gear **208**. Vibration gear **208**, in turn, drives disc drive gears **220**.

As disc drive gears **220** rotate, they drive bearings **210** and bearing supports **209**. Bearings **210** and bearing supports **209**, in turn, drive disc assemblies **500** (**FIGs. 7-9**).

As was described above, the two rows of disc assemblies **500** are mounted on curved shafts **219** (**FIGs. 3, 5, 6**). This curvature results in disc assemblies **500** having little room between one another near the top of the hair removal device **10** so that disc assemblies **500** are actually compressed together at the top of the hair removal device **10**. This compression of disc assemblies at the top of the hair removal device **10** creates traps for hair.

Specifically, when disc assemblies **500** rotate, they are compressed, or push against one another, at the top of the hair removal device **10**. As a result, opposing pinchers **306** mounted on U-shaped members **305** presses flattened peripheral portions **402** of adjacent disc assemblies **500** against their corresponding flattened peripheral portions **502**, as illustrated in **FIG. 7-9**. Pressing flattened peripheral portions **402** against corresponding peripheral portions **502** forms traps for hair, as was described above and illustrated in **FIG. 9**.

While hair-plucking assembly **14** is driven by disc drive gears **220**, vibration gear **208** drives vibration assembly **603**, wherein eccentric cylinder **601** lifts and lowers the vibration element **217** rapidly, as vibration gear **208** rotates, in order to generate the massage function of the present invention. Specifically, when vibration gear **208** rotates to the position shown in **FIG. 11**, vibration beam **217** moves to a low position close to disc assemblies **500**. When vibration gear **208** rotates to the position shown in **FIG. 12**, vibration beam **217** moves to a high position away from disc assemblies **500**. Therefore, as vibration gear **208** rotates continuously, vibration beam **217** moves towards and away from disc assemblies **500** rapidly, creating vibrations that massage the hair removal area.

In an alternative embodiment that includes two rows of disc assemblies **500**, one row of disc assemblies **500** may be made to rotate in an opposite direction with respect to the other row of disc assemblies **500** such that hair is pulled away from hair removal

device **10** and skin in the hair removal area is stretched to reduce discomfort associated with hair removal.

It should be noted that the disclosed embodiments can be modified by a  
5 person skilled in the art without deviating from the scope of the present invention. For example, the orientation of hair-plucking assembly **14** in relation to housing **17** may be varied in any number of alternative configurations to optimize efficiency and convenience of use. Examples of suitable alternative configurations are described in the above-mentioned Dolev patent, incorporated herein by reference in its entirety.

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While the invention has been described in conjunction with specific embodiments, it is evident that numerous alternatives, modifications, and variations will be apparent to those skilled in the art in light of the forgoing descriptions. The scope of this invention is defined only by the following claims.

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What Is Claimed Is:

- 5                   1.     A hair removal device comprising:  
                      (a) a housing; and  
                      (b) a hair-plucking assembly having at least two groups of disc  
                          assemblies mounted within said housing.
- 10                   2.     The hair removal device of claim 1, wherein said disc assemblies are  
                      arranged in at least two rows.
3.     The hair removal device of claim 1, wherein said rows are adjacent to  
                          one another.
- 15                   4.     The hair removal device of claim 3, wherein said rows are parallel to  
                      one another.
5.     The hair removal device of claim 2, wherein said disc assemblies  
                          arranged in one row are rotationally fixed with respect to one another.
- 20                   6.     The hair removal device of claim 1, wherein said disc assemblies  
                      rotate at a constant speed.
7.     The hair removal device of claim 1, wherein said disc assemblies are  
25                   identical.
8.     The hair removal device of claim 1, wherein each said disc assembly  
                          comprises an internal disc assembly.
- 30                   9.     The hair removal device of claim 8, wherein said internal disc  
                      assembly comprises an insert disc, having at least one arm, mounted  
                          on a disc carrier.
- 35                   10.    The hair removal device of claim 9, wherein said disc assembly  
                      comprises a pair of outer discs, each having at least one arm, pressed  
                          against said arm(s) of said internal disc to form traps for hair.

- 5 11. The hair removal device of claim 10, wherein said disc carrier comprises at least one U-shaped member for engaging at least one arm of each of said pair of outer discs so as to impart rotational motion to said pair of outer discs upon rotation of said internal disc assembly about an axis of said internal disc assembly.
- 10 12. The hair removal device of claim 11, wherein said disc carrier further comprises at least a pair of pinchers that extend axially from said U-shaped member(s) beyond the plane of said arm(s) of each of said pair of outer discs for imparting a clamping force on at least one adjacent disc carrier.
- 15 13. The hair removal device of claim 12, wherein said disc carrier further comprises engagement means for engaging at least one adjacent disc carrier so that rotational movement of one disc carrier imparts rotational motion to at least one adjacent disc carrier.
- 20 14. The hair removal device of claim 13, wherein said engagement means comprises engagement protrusions and engagement recessions for engaging corresponding engagement protrusions and recessions of at least one adjacent disc carrier.
- 25 15. The hair removal device of claim 1, wherein said disc assemblies are rotatably mounted on two shafts.
- 30 16. The hair removal device of claim 15, wherein said shafts are curved such that said disc assemblies are mounted in an inclined angle.
- 35 17. The hair removal device of claim 9, wherein said disc carrier is made of Acetal plastic.
18. The hair removal device of claim 10, wherein said insert disc and said pair of outer discs are made of stainless steel.
19. A hair removal device comprising:  
(a) a housing;  
(b) a hair-plucking assembly; and

(c) a vibration assembly mounted within said housing.

20. The hair removal device of claim 19, wherein said vibration assembly comprises a vibration element to massage the hair removal area.

21. The hair removal device of claim 20, wherein said vibration element is rotatably mounted on eccentric cylinders.

22. The hair removal device of claim 20, wherein said vibration element vibrates at a constant speed.

23. The hair removal device of claim 19, wherein said housing comprises brackets for mounting said hair-plucking assembly and said vibration assembly to said housing.

24. The hair removal device of claim 20, wherein said vibration element is located adjacent to said hair-plucking assembly.

25. The hair removal device of claim 20, wherein said vibration element moves towards and away from said hair-plucking assembly.

26. The hair removal device of claim 20, wherein said vibration element spans at least the width of said hair-plucking assembly.

27. The hair removal device of claim 19 wherein said hair-plucking assembly comprises disc assemblies arranged in at least two rows.

28. The hair removal device of claim 27, wherein said vibration element is located in between said rows of disc assemblies.

29. The hair removal device of claim 19, wherein said hair-plucking assembly and said vibration assembly are powered by a driving assembly.

30. A hair removal device comprising:  
(a) a housing;

- (b) a hair-plucking assembly having at least two groups of disc assemblies mounted within said housing; and
- (c) a vibration assembly mounted within said housing.

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# **ABSTRACT**

A device for removing unwanted hair, including a hair-plucking assembly, and a vibration assembly, a driving assembly, and a housing. The hair-plucking assembly  
5 includes two groups of disc assemblies that remove hair as they rotate. As the hair-plucking assembly removes hair, the vibration assembly vibrates to massage the area of hair removal to minimize discomfort associated with the hair removal.

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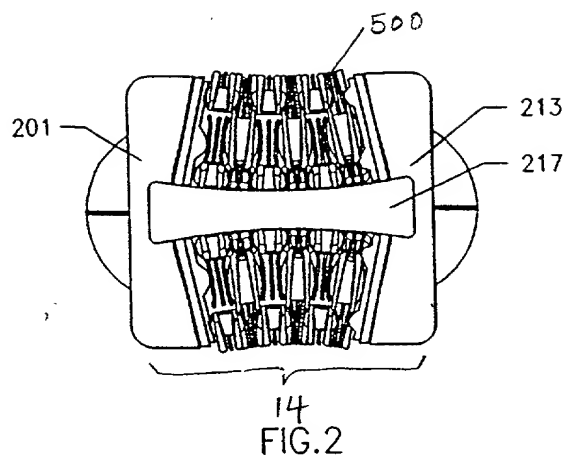


FIG. 2

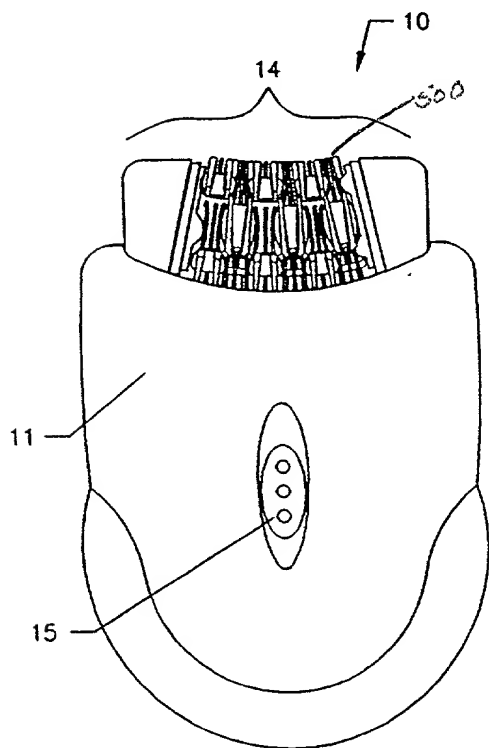


FIG. 1

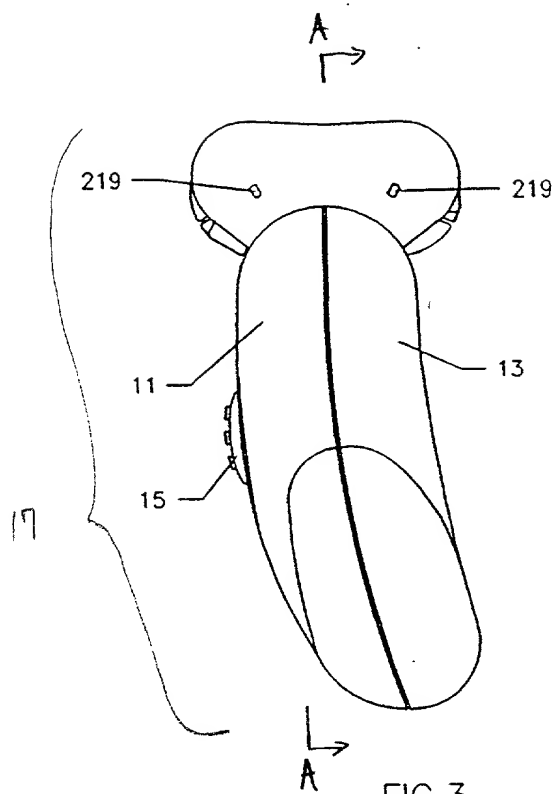
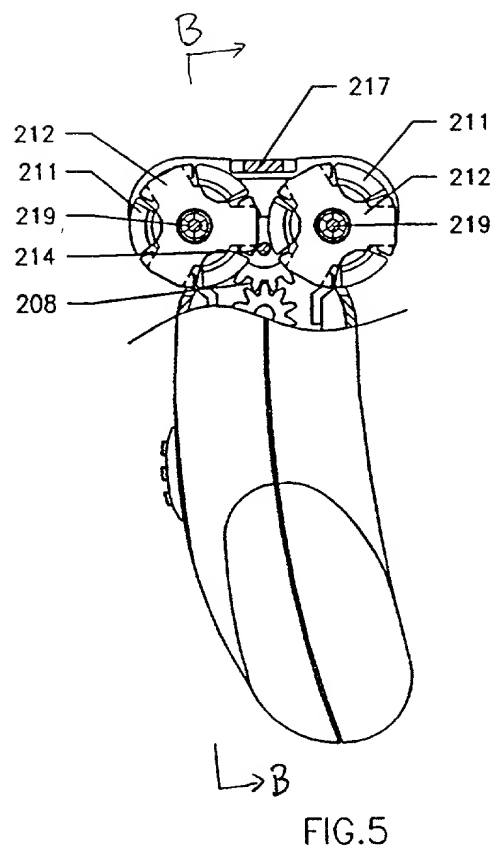
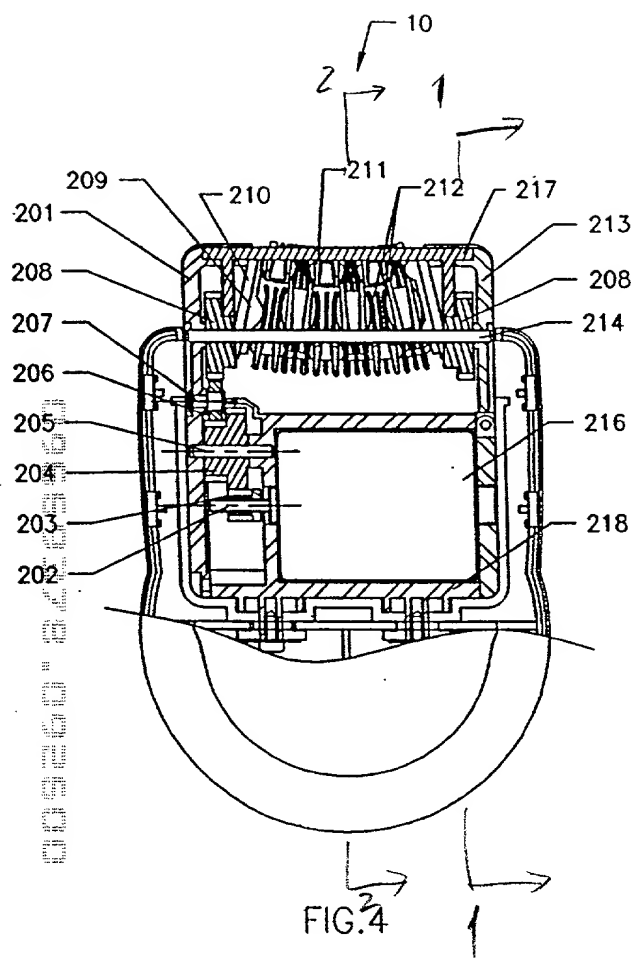


FIG.3



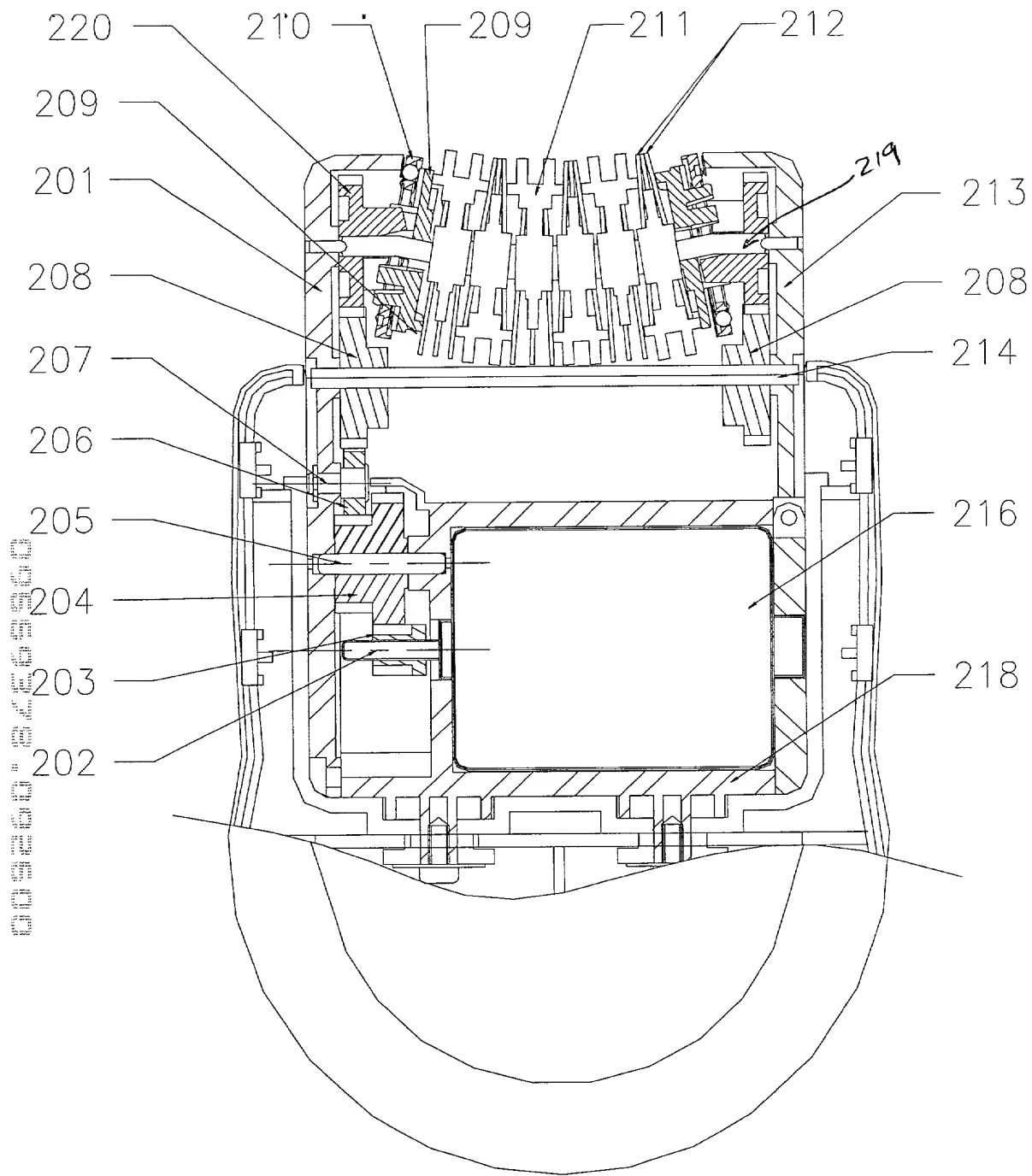
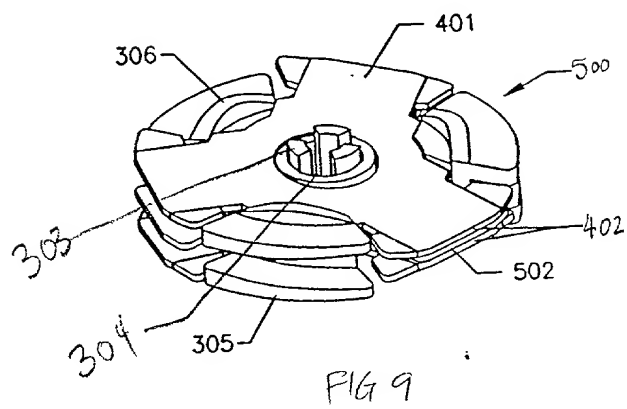
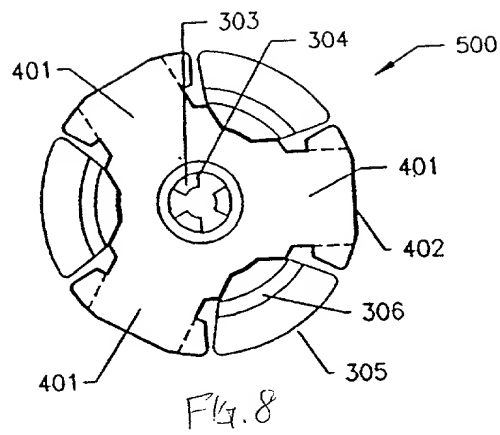
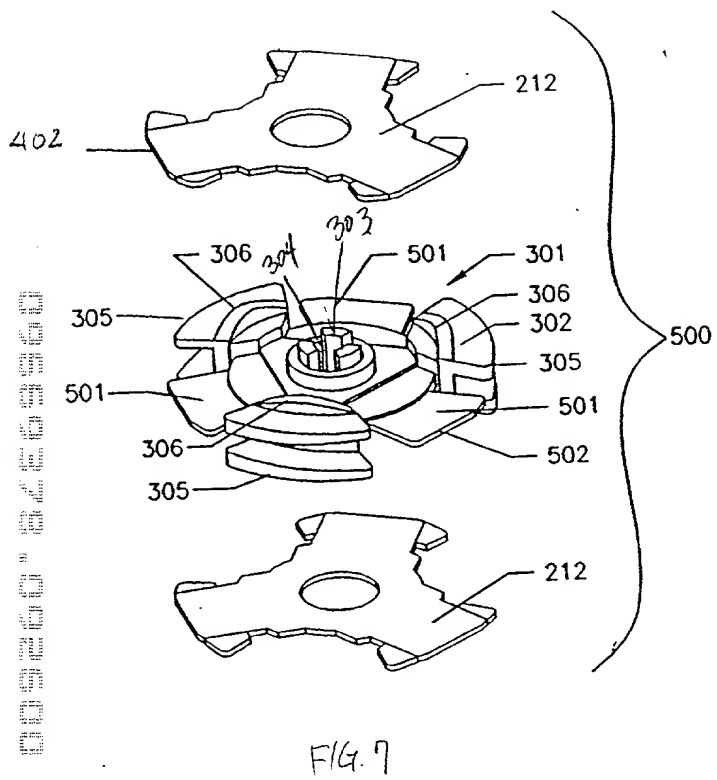
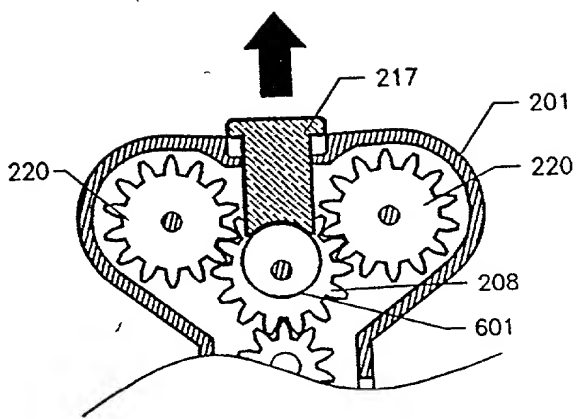
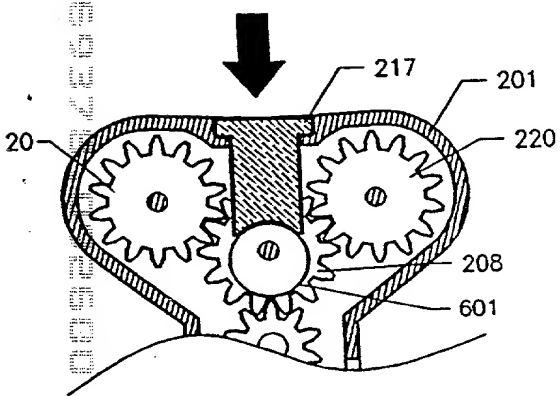
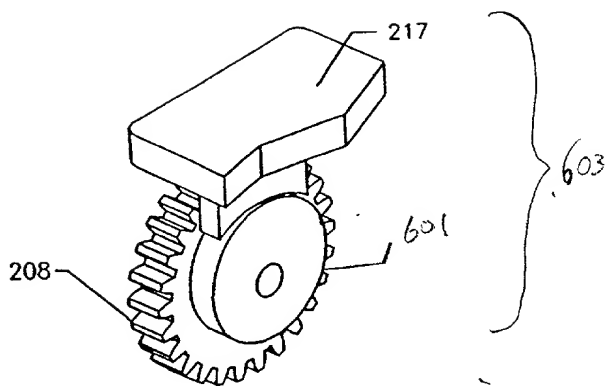


FIG. 6





# DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below at 201 et seq. underneath my name.

I believe I am the original, first and sole inventor if only one name is listed at 201 below, or an original, first and joint inventor if plural names are listed at 201 et seq. below, of the subject matter which is claimed and for which a patent is sought on the invention entitled

HAIR REMOVAL DEVICE WITH DISC AND VIBRATION ASSEMBLIES

and for which a patent application:

- ☒ is attached hereto and includes amendment(s) filed on *(if applicable)*  
☐ was filed in the United States on as Application No. *(for declaration not accompanying application)*  
 with amendment(s) filed on *(if applicable)*  
☐ was filed as PCT international Application No. on and was amended under PCT Article 19 on *(if applicable)*

I hereby state that I have reviewed and understand the contents of the above identified application, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119(a)-(d) of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

EARLIEST FOREIGN APPLICATION(S), IF ANY, FILED PRIOR TO THE FILING DATE OF THE APPLICATION			
APPLICATION NUMBER	COUNTRY	DATE OF FILING (day, month, year)	PRIORITY CLAIMED
			YES <input type="checkbox"/> NO <input type="checkbox"/>
			YES <input type="checkbox"/> NO <input type="checkbox"/>

I hereby claim the benefit under Title 35, United States Code, §119(e) of any United States provisional application(s) listed below.

APPLICATION NUMBER	FILING DATE

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code §112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

APPLICATION SERIAL NO.	FILING DATE	STATUS		
		PATENTED	PENDING	ABANDONED
09/246,454	February 9, 1999		x	
09/112,971	July 9, 1998	x		

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	POST OFFICE ADDRESS	STREET	CITY	STATE OR COUNTRY	ZIP CODE
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	POST OFFICE ADDRESS	STREET	CITY	STATE OR COUNTRY	ZIP CODE
204	FULL NAME OF INVENTOR	LAST NAME	FIRST NAME	MIDDLE NAME	
	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP	
	POST OFFICE ADDRESS	STREET	CITY	STATE OR COUNTRY	ZIP CODE
205	FULL NAME OF INVENTOR	LAST NAME	FIRST NAME	MIDDLE NAME	
	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP	
	POST OFFICE ADDRESS	STREET	CITY	STATE OR COUNTRY	ZIP CODE
206	FULL NAME OF INVENTOR	LAST NAME	FIRST NAME	MIDDLE NAME	
	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP	
	POST OFFICE ADDRESS	STREET	CITY	STATE OR COUNTRY	ZIP CODE

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

SIGNATURE OF INVENTOR 201	SIGNATURE OF INVENTOR 202	SIGNATURE OF INVENTOR 203
DATE	DATE	DATE
SIGNATURE OF INVENTOR 204	SIGNATURE OF INVENTOR 205	SIGNATURE OF INVENTOR 206
DATE	DATE	DATE